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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,927	10/21/2003	Kazuya Tanabe	0505-1250P	3170

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EXAMINER
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LEUNG, KA CHUN A

ART UNIT	PAPER NUMBER
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3747

NOTIFICATION DATE	DELIVERY MODE
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04/11/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/688,927	<b>Applicant(s)</b> TANABE ET AL.	
	<b>Examiner</b> Ka Chun Leung	<b>Art Unit</b> 3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-15 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-10, 12-15 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This Office Action is in response to Applicant's amendment filed on 12/19/2007.

#### ***Claim Objections***

2. Claims 8 and 9 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 8 and 9 both recite the limitation wherein the atmospheric pollutant treatment structure further comprises "a fan cover connected to the upper portion and lower portion cover members". However, base Claim 1 already recites "wherein the upper and lower portion cover members are connected to the fan cover" and therefore the claim limitations of Claims 8 and 9 do not further limit the subject matter of the previous claim.

#### ***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### **Onda et al and Poles et al**

4. Claims 1-2, 6-9, 12-14, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onda et al (US Patent 4,632,070) in view of Poles (US 2001/0021363).

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5. Onda et al discloses a device for cooling an engine power unit comprising an engine (4) with a cylinder block (4a) and a cylinder head (4b), a shroud (16), a first fan (19), a second fan (20), an exterior air inlet (17). However Onda et al does not disclose the use of a catalyst layer on the cooling fins for treating atmospheric pollutants.

6. Poles et al discloses a method and apparatus for treating the atmosphere by utilizing a catalyst that can treat pollutants, such as ozone, at ambient conditions “by coating a surface (e.g. motor vehicle atmosphere contacting surfaces)”. Poles et al recited in paragraph [0066]:

“The atmosphere contacting surface of the substrate which contains the pollution treating composition is in direct contact with the atmosphere. Preferred and useful atmosphere contacting surfaces include billboards, signs, heat exchange coils, air conditioning systems, surfaces associated with supplying air to tunnels, and surfaces associated with motor vehicles such as body surfaces, sign deflector surfaces, grill surfaces, mirror backs. Such surfaces must contact the ambient air alone (i.e. relying on natural wind currents) or through the assistance of an air drawing or forcing means such as a fan.”

Additionally, Poles et al recites in paragraph [0087]:

“Ozone treating catalyst compositions comprise manganese compounds including manganese dioxide...”.

7. Thus it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have provided the engine surfaces of Onda et al that contact ambient drawn by the fan with an ozone treating catalyst, in light of the teachings of Poles et al, in order to convert the pollutant ozone into oxygen.

8. Specifically regarding Claim 1, the cooling fins as depicted on the cylinder block (4a) and cylinder head (4b) uses air inducted by the cooling first fan (19) through the

inlet (17) to cool the engine and is therefore a good candidate for the application of the above ozone treating catalyst. With regards to the limitation that the shroud is provided with an “upper portion” and “lower portion” cover members, the shroud of Onda et al inherently has an upper half and lower half, defined for example as the portion above the crankshaft and below the crankshaft (5) when viewed in the orientation of Figure 3. The two portions as a whole define a cooling outer path (21) and helps direct cooling air to the engine. Onda et al is silent on whether the shroud is formed in multiple pieces or integrally, but in either case the region with the top surface can be identified as a “top portion” and the lower surface can be identified as a “lower portion”. As depicted in Figure 3, Onda et al further discloses providing a cover member provided within the inlet surrounding the lead-in pipe (22). Note that the bottom of the figure can be considered as a forward direction of the engine and the cover depicted is located forward of the forward-most part of the fan.

9. Specifically regarding Claims 2 and 13, the inner surface of the shroud (16) defines a cooling outer path (21), guiding and directing air inducted by the first cooling fan (19) and is therefore also a good candidate for the application of the above ozone treating catalyst.

10. Specifically regarding Claim 12, it is known in the art to produce fan shrouds/cowls using a plastic material (for examples see US 6,123,051 and US 6,189,492) and moreover it is common to form these shrouds using an injection-molded process (for examples see US 5,423,660 and US 6,595,744). It is well known in the art of injection-molding to provide the use of ribs to strengthen parts instead of increasing

the thickness of the walls, and further to provide dimensional control during the injection molding process (see articles entitled "Injection Molding Design Guidelines", "Plastic Injection Molding" and "Ribs & Webs"). Note that since the shroud has curved cross section, it would have been obvious to one of ordinary skill in the art to produce an injected molded shroud with curved ribs (corresponding to the shroud curvature) to strengthen and stiffen the shroud without increasing the thickness of the wall.

11. Specifically regarding Claim 14, Figure 3 illustrates the shroud (16) as being installed on the exterior of the device and therefore acts as a "body cover" providing a barrier between the exterior and interior.

Onda et al, Poles et al, Tominaga et al and Shibata et al

12. Claims 3, 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onda et al (US Patent 4,632,070) and Poles (US 2001/0021363), and further in view of Tominaga et al (US Patent 4,395,980) and Shibata et al (US Patent 4,744,432).

13. Onda et al discloses a device for cooling an engine power unit comprising an engine (4) with a cylinder block (4a) and a cylinder head (4b), a shroud (16), a first fan (19), a second fan (20), an exterior air inlet (17). Poles et al, as described above, discloses a method and apparatus for treating the atmosphere by utilizing a catalyst that can treat pollutants, such as ozone, at ambient conditions "by coating a surface (e.g. motor vehicle atmosphere contacting surfaces)". However, neither of the references disclose providing an ignition plug projecting from the side of the cylinder into a portion of the cooling air passage.

14. Both Tominaga et al (see Figure 2) and Shibata et al (see Figure 5) disclose providing an ignition or spark plug mounted to their respective cylinder heads at an oblique angle and additionally has a cooling air passage is provided adjacent to the ignition/spark plug. In addition the cooling passage provides cooling for the cylinder head and surrounding components.

15. Thus it would have been obvious to one of ordinary skill in the art to apply the technique of providing an ignition/spark plug at an oblique angle and providing cooling air passage in the cylinder heads as taught by Tominaga et al and Shibata et al, to improve the cooling system of Onda et al and Poles et al for the predictable result of providing air cooling for both the ignition/spark plug and cylinder head.

Onda et al, Poles et al and Wernholm et al

16. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onda et al (US Patent 4,632,070) and Poles (US 2001/0021363), and further in view of Wernholm et al (US Patent 6,692,551).

17. Onda et al discloses a device for cooling an engine power unit comprising an engine (4) with a cylinder block (4a) and a cylinder head (4b), a shroud (16), a first fan (19), a second fan (20), an exterior air inlet (17). Poles et al, as described above, discloses a method and apparatus for treating the atmosphere by utilizing a catalyst that can treat pollutants, such as ozone, at ambient conditions "by coating a surface (e.g. motor vehicle atmosphere contacting surfaces)". Poles et al additionally notes in the Background that prior art reference US 3,738,088 discloses the use of an air filtering

assembly for cleaning pollution from ambient air by utilizing a vehicle as a mobile cleaning device. However, Poles et al does not distinctly disclose the application of the ozone treating catalyst disposed in an air cleaner.

18. Wernholm et al discloses an air cleaner assembly (10) and process comprising a housing (12, 14) with a filter element situated therein, an outlet (16) for allowing filtered air to flow to the engine, and an inlet conduit (22) extending from the housing for permitting the entry of air. The air cleaner assembly (10) further comprises an absorber member (34), as described in Column 4, Paragraph 3, which may “comprise a substrate coated material” and further “have a sufficient surface area and structural integrity to support a pollutant treating material, and, where desired, a catalyst.” As described in Column 5, the “pollutant treating material can be capable of absorbing pollutant contained in the air surrounding the substrate” and one of the contemplated pollutants listed is ozone.

19. Thus it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have provided the air cleaner of Onda et al and Poles et al with an absorber member, in light of the teachings of Wernholm et al, in order to treat pollutants contained in the air surrounding the substrate such as ozone in the ambient air being inducted into the engine.



Onda et al, Poles et al and Keller

20. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onda et al (US Patent 4,632,070) and Poles (US 2001/0021363), and further in view of Keller (US Patent 2,635,858).

21. Onda et al discloses a device for cooling an engine power unit comprising an engine (4) with a cylinder block (4a) and a cylinder head (4b), a shroud (16), a first fan (19), a second fan (20), an exterior air inlet (17). Poles et al, as described above, discloses a method and apparatus for treating the atmosphere by utilizing a catalyst that can treat pollutants, such as ozone, at ambient conditions “by coating a surface (e.g. motor vehicle atmosphere contacting surfaces)”. However, neither reference discloses the use a plurality of through holes or cut outs on the cooling fins. Note that as recited in the claims, the “through holes” can also be interpreted as a type of “cut outs”.

22. Keller discloses a vibration damping means and is particularly directed to damping vibrations of fins projecting from a body that is to be heated or cooled. Keller cites for example “cylinders of an air-cooled internal combustion engine are provided with a plurality of spaced fins projecting therefrom...”. Keller discloses the use of rubber-like damper members (16) installed between the fins. A projecting button portion (20) of the damper member (16) is provided to extend into a fin hole (14) provided on the cooling fins (12).

23. Thus it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have provided the cooling fins of Onda et al and Poles

et al with fin holes for the installation of damper members, in light of the teachings of Keller, in order to damp vibration of fins projecting from the cylinder.

Onda et al, Poles et al and Busch et al

24. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onda et al (US Patent 4,632,070) and Poles (US 2001/0021363), and further in view of Busch et al (US 2001/0052410).

25. Onda et al discloses a device for cooling an engine power unit comprising an engine (4) with a cylinder block (4a) and a cylinder head (4b), a shroud (16), a first fan (19), a second fan (20), an exterior air inlet (17). Poles et al, as described above, discloses a method and apparatus for treating the atmosphere by utilizing a catalyst that can treat pollutants, such as ozone, at ambient conditions “by coating a surface (e.g. motor vehicle atmosphere contacting surfaces)”. However, both references are silent on the use of cooling fins with protrusions.

26. Note that parts produced by casting, such as cooling fins (either integrally with the engine block 1 or separately installed), does not have a perfectly smooth surface and therefore contain many micro-protrusions that are capable of producing turbulence (please see the article entitled “Case Study #2” which performs a “media blast and acid etch” operation to increase air turbulence for increased cooling). Thus, the cooling fins of Onda et al would inherently have micro-protrusions on the surface of the cooling fins capable of producing turbulence.

27. Alternatively, Busch et al discloses a cooling fin arrangement on a cooling fluid-receiving surface where the cooling fins comprise traditionally a smooth outer surface (17) so that the boundary layer (18) along the cooling fins is laminar. By providing a disruptive element (20) to break this laminar flow pattern to create turbulence and thus improving heat transfer from the cooling fins.

28. Thus it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have provided the cooling fins of Onda et al and Poles et al with disruptive elements, in light of the teachings of Busch et al, in order to create a turbulent flow over the cooling fins to improve heat transfer from the cooling fins

***Allowable Subject Matter***

29. Claim 4 is allowed.

30. The following is an examiner's statement of reasons for allowance: the prior art of record fails to disclose or render obvious the combination of features as claimed and in particular wherein a forward-most part of the shroud is attached to the cylinder head and a rear-most part of the shroud is attached to the fan cover at a position forward of a forward-most part of the fan.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Remarks/Arguments***

31. Applicant's arguments with respect to Claims 1-3, 5-10, 12-16 and 17-20 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

32. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

33. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ka Chun Leung whose telephone number is (571)272-9963. The examiner can normally be reached on 7:30AM - 4:30PM.

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35. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Cronin can be reached on (571) 272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

36. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ka Chun Leung/  
Examiner, Art Unit 3747

/Stephen K. Cronin/  
Supervisory Patent Examiner, Art Unit 3747